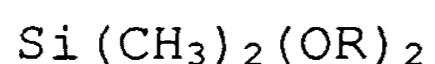


What is claimed is:

1. In a method for forming a porous silica film using a hydrolyzable alkoxy silane compound, water, an alcohol and a surfactant, the method for forming a porous silica film, which
5 comprises using one or more kinds of nonionic surfactant(s) having a 0.1 weight % concentration according to the Du Nouy method expression and a surface tension of 45mN/m or larger at 25°C as the surfactant, coating a mixed solution obtained by mixing the nonionic surfactant, the alkoxy silane compound,
10 water and the alcohol on a substrate, and decomposing or burning out the surfactant in the mixed solution.
2. The method for forming a porous silica film according to claim 1, wherein the nonionic surfactant comprises a
15 polyoxyethylene-polyoxypropylene condensate represented by [Chemical formula 1].
$$\text{OH}(\text{CH}_2\text{CH}_2\text{O})^x(\text{CH}(\text{CH}_3)\text{CH}_2\text{O})^y(\text{CH}_2\text{CH}_2\text{O})^x\text{H}$$

• • [Chemical formula 1]
(In a rational formula [Chemical formula 1], x and y denote an
20 integer satisfying $1 \leq x \leq 185$ and $5 \leq y \leq 70$, respectively.)
3. The method for forming a porous silica film according to claim 2, wherein a mixing ratio in the mixed solution is 8 to 50 mole of the water, and 0.1 to 0.5 mole of the
25 polyoxyethylene-polyoxypropylene condensate represented by [Chemical formula 1] relative to 1 mole of the alkoxy silane compound.

4. The method for forming a porous silica film according to
claim 3, wherein 0.05 to 0.5 mole of a dimethyldialkoxysilane
compound represented by [Chemical formula 2] is further added
5 to the mixed solution.



• • • [Chemical formula 2]

(In a rational formula [Chemical formula 2], a substituent R
denotes a methyl group or an ethyl group).

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5. The method for forming a porous silica film according to
any one of claims 1 to 4, wherein a mixed surfactant obtained
by mixing a cationic or nonionic surfactant into the nonionic
surfactant is used as the surfactant.

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6. The method for forming a porous silica film according to
any one of claims 1 to 4, wherein a worm-hole porous structure
can be observed by a sectional transmission electron
microscope in a silica film formed by decomposition or burning
20 out the surfactant.

7. The method for forming a porous silica film according to
claim 5, wherein a worm-hole porous structure can be observed
by a sectional transmission electron microscope in a silica
25 film formed by decomposition or burning out the surfactant.